

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: Jong-Young YUN

Serial No.: 10/687,370 Examiner: Garland, Steven R.

Filed: October 15, 2003 Group Art Unit: 2125

Confirmation No.: 9277

For: INTERLOCK APPARATUS AND METHOD FOR SUPPLYING GAS  
TO A SEMICONDUCTOR MANUFACTURING DEVICE

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**AMENDMENT**

This paper is responsive to the non-final Office Action (Paper No. 03092006) that was mailed on 20 March 2006.

**Drawing Amendments** begin on page 2 of this paper.

**Claim Amendments** begin on page 3 of this paper.

**Remarks/Arguments** begin on page 5 of this paper.

An **Appendix** containing a replacement sheet for FIG. 1 and a supplemental declaration is attached following page 7 of this paper.

### **IN THE DRAWINGS**

A replacement sheet for FIG. 1 is attached following page 8 of this paper. FIG. 1 is amended to include the word "Conventional."

## IN THE CLAIMS

1. (Currently amended) A device with an interlock apparatus for supplying gas to a semiconductor manufacturing device, the device comprising:
  - at least one solenoid valve configured to control the supply of a gas from a gas source to the semiconductor manufacturing device by open/shut operations;
  - a main controller configured to output a control signal for the semiconductor manufacturing equipment and a driver signal;
  - a driver configured to apply a driving voltage to the at least one solenoid valve in response to the driver signal from the main controller; and
  - an interlocker configured to sense the open/shut state of the at least one solenoid valve by sampling the driving voltage and comparing it to a reference voltage, and the interlocker further configured to transmit an interlock signal to the main controller.
2. (Original) The device of claim 1, wherein the interlocker comprises:
  - a comparator configured to compare the driving voltage of the at least one solenoid valve with a reference voltage value, and configured to transmit a result of the comparison to the main controller.
3. (Original) The device of claim 2, further comprising:
  - a display configured to display an abnormal state indicator when the result indicates an abnormal operation of the at least one solenoid valve.
4. (Original) The device of claim 2, further comprising:
  - a backflow cutoff valve, coupled between the gas source and the at least one solenoid valve, configured to prevent the gas from flowing backward.
5. (Currently amended) A method of supplying gas to a semiconductor manufacturing device comprising:
  - outputting a control signal from a main controller;
  - applying a driving voltage to at least one solenoid valve in response to the control signal to control the supply of gas;

comparing the driving voltage with a reference voltage to obtain comparison data;  
transmitting the comparison data to the main controller;~~and~~  
transmitting an interlock generation signal from the main controller to the semiconductor manufacturing device in response to the comparison data; and.  
preventing gas flow from a gas source to another gas source.

6. (Original) The method of claim 5, further comprising:  
displaying an abnormal state indicator when the comparison data indicates an abnormal operation of the at least one solenoid valve.

7. (New) A device with an interlock apparatus for supplying gas to a semiconductor manufacturing device, the device comprising:  
at least one solenoid valve configured to control the supply of a gas from a gas source to the semiconductor manufacturing device by open/shut operations;  
a main controller configured to output a control signal for the semiconductor manufacturing equipment and a driver signal;  
a driver configured to apply a driving voltage to the at least one solenoid valve in response to the driver signal from the main controller;  
an interlocker configured to compare the driving voltage of the at least one solenoid valve with a reference voltage value, and configured to transmit a result of the comparison to the main controller; and  
a backflow cutoff valve that is coupled between the gas source and the at least one solenoid valve, the backflow cutoff valve configured to prevent the gas from flowing backward.

8. (New) The device of claim 7, further comprising a display configured to display an abnormal state indicator when the result indicates an abnormal operation of the at least one solenoid valve.

## REMARKS

Claims 1 and 5 are amended. Claims 7 and 8 are new. No new subject matter is added. Claims 1-8 are now pending in the case. Reconsideration and allowance of the pending claims is requested in light of the following remarks.

### *Erroneous Information Disclosure*

The 29 documents filed on 4 February 2004 do not belong with this application. It appears that the 29 documents were placed in the application file by error.

### *Supplemental Declaration*

A supplemental declaration is found in the Appendix that is attached following page 7 of this paper.

### *Drawings*

Figure 1 is amended to include the word "Conventional."

### *Allowable Subject Matter*

Claim 4 is objected to as being dependent upon a rejected base claim, but is otherwise indicated to be allowable if rewritten in independent form to include all the subject matter of the base claim and any intervening claim.

In keeping with this suggestion of allowable subject matter, new claim 7 is added. Claim 7 contains the features of original claims 1 and 2. Claim 8 depends from claim 7, and is allowable for at least that reason.

### *In the Claims*

The amendment of claim 1 is fully supported by the original application at, e.g., page 4, lines 1-5.

The amendment of claim 5 is fully supported by the original application at, e.g., claim 4.

### *Claim Rejections – 35 U.S.C. § 112*

Claims 5 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The applicant disagrees.

Claim 5 is amended to incorporate the examiner's suggestion for particularly pointing out and distinctly claiming the subject matter of the invention. Claim 6 depends from claim 5.

### *Claim Rejections – 35 U.S.C. § 103*

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over the Acknowledged Prior Art (APA) of FIG. 1 in view of U.S. Patent No. 5,119,683 to Deutsch, et al. ("Deutsch") and U.S. Patent No. 5,433,344 to Fulton, et al. ("Fulton"). The applicant disagrees.

Claim 1 recites an interlocker configured to sense the open/shut state of the at least one solenoid valve by sampling the driving voltage generated by the driver and comparing it to a reference voltage.

APA was recognized as failing to teach this feature.

Contrary to this feature, Deutsch specifically teaches that the flyback pulses are generated by the solenoid (see, e.g., column 2, lines 49-50; column 3, lines 12-13). Thus, Deutsch also fails to teach or suggest an interlocker configured to sense the open/shut state of the at least one solenoid valve by sampling the driving voltage generated by the driver and comparing it to a reference voltage.

Contrary to this feature, Fulton fails to teach or suggest that an interlocker is configured to sense the open/shut state of the at least one solenoid valve by sampling the driving voltage generated by the driver and comparing it to a reference voltage.

Consequently, the combination of APA, Deutsch, and Fulton fails to establish *prima facie* obviousness for claim 1 because it does not teach or suggest all the features recited in the claim. MPEP 2143.03.

Claims 1-3, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the APA of FIG. 1 in view of JP 2000-161532 to Tetsuya, et al. ("Tetsuya") and Fulton. The applicant disagrees.

Regarding claim 1, it was explained above that neither APA nor Fulton teach or suggest the recited feature of an interlocker configured to sense the open/shut state of the at least one solenoid valve by sampling the driving voltage and comparing it to a reference voltage.

Furthermore, while Tetsuyana appears to determine whether a valve is operating normally or not (see, e.g., Abstract), Tetsuyana fails to teach or suggest that “operating normally” includes sensing the open/shut state of the solenoid valve by sampling the driving voltage and comparing it to a reference voltage.

Claims 2 and 3 depend from claim 1. Consequently, claims 2-3 are allowable over the combination of APA, Tetsuya, and Fulton at least because any claim that depends from a nonobvious independent claim is also nonobvious. MPEP 2143.03.

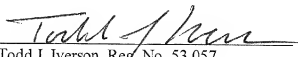
Claim 5 recites preventing gas flow from a gas source to another gas source. As was recognized with claim 4, the prior art of record fails to teach or suggest this feature. Consequently, the prior art of record fails to establish *prima facie* obviousness for claim 5. MPEP 2143.03.

Claim 6 depends from claim 5. Consequently, claim 6 is allowable over the combined prior art of record at least because any claim that depends from a nonobvious independent claim is also nonobvious. MPEP 2143.03.

### ***Conclusion***

For the reasons presented above, reconsideration and allowance of the pending claims is requested. Please telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

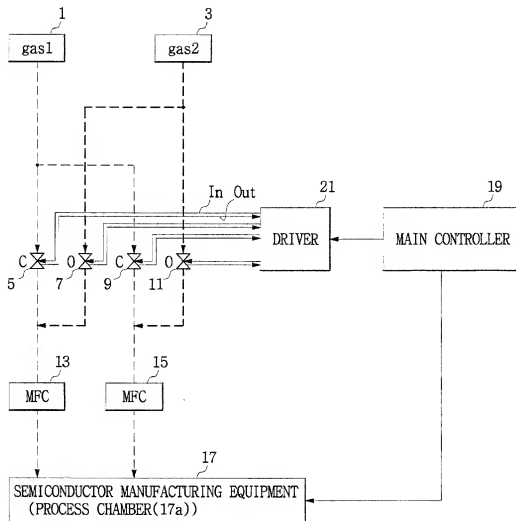
Respectfully submitted,  
MARGER JOHNSON & McCOLLOM, P.C.

  
Todd J. Iverson, Reg. No. 53,057

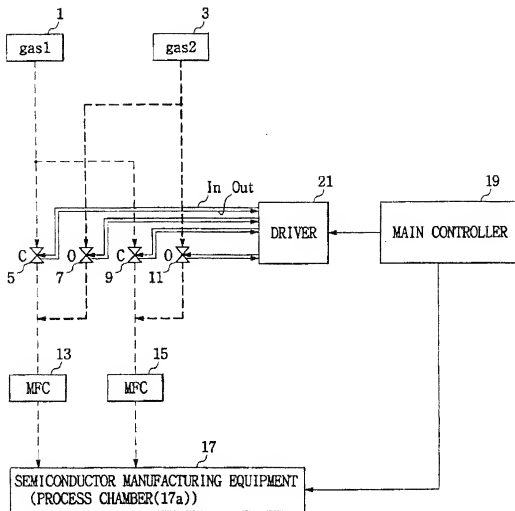
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Annotated Sheet Showing Changes

**FIG. 1**  
(CONVENTIONAL)



**FIG. 1**  
(CONVENTIONAL)

## PATENT APPLICATION

Docket No.: 8750-048

Client Ref. No.: SPX200210-0006US

## SUPPLEMENTAL DECLARATION FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled **INTERLOCK APPARATUS AND METHOD FOR SUPPLYING GAS TO A SEMICONDUCTOR MANUFACTURING DEVICE**, the specification of which:

- ☐ is attached hereto.  
☒ was filed on October 15, 2003 as Application Serial No. 10/687.370

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, Sec. 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Sec. 119(a)-(d) or § 365 (b) of any foreign application(s) for patent or inventor's certificate, or § 365 (a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

10-2002-70912  
(Number)Republic of Korea  
(Country)14 November 2002

(Day/Month/Year Filed)

Priority Claimed?

☒ ☐  
Yes No

I hereby claim the benefit under Title 35, United States Code, Sec. 119(e) of any United States provisional application listed below:

Provisional Application No.Filing Date

I hereby claim the benefit under Title 35, United States Code, Sec. 120 or §365 (c) of any PCT international application designating the United States of America listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Sec. 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Sec. 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(App. Serial No.)

(Filing Date)

(Status -patented, pending, etc.)


I hereby appoint the attorneys or agents associated with Customer No. 20575 to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with the above application.

Direct all telephone calls to Todd J. Iverson at (503) 222-3613 and send all correspondence to the following address associated with Customer No. 20575:

MARGER JOHNSON & McCOLLOM, P.C.  
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Portland, Oregon 97204

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full name of sole or first inventor: Jong-Young YUN

Inventor's signature: 

2006.6.18  
(Date)

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